Impact of Crown Rot on Winter Cereals

Trial ID: **NGA0802** **Location:** **North Star** **Year** **2008**
Investigator: **Clare Felton-Taylor**

Objective:	**To evaluate the impact of crown rot inoculum on cereal variety yield and grain quality**		
Planting Date:	**6/06/2008**		
Crops:	**Barley**	**Bread wheat**	**Durum wheat**
Varieties:	**Skiff, Grout, Fitzroy and Gairdner**	**EGA Wylie, Sunco, Lang, Sunvale, EGA Gregory, Strzelecki and Ellison**	**Bellaroi and Jandaroi**
Harvest Date:	**11/11/2008**		
***Fusarium pseudograminearum* level at planting:**	**0 pg DNA/g soil (PreDicta B)**		
Keywords:	**Crown rot, yield loss, wheat, barley, durum**		

NB: Crown rot inoculum supplied by Dr Steven Simpfendorfer NSW DPI. Pathogen cultured on sterilised millet seed and then added with cereal variety seed at planting.

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Trt No.	Crop	Variety	Crown Rot Level & Inoculum added	Emergence 19 DAP Plants/m²	Final Tillers /m Row	Yield t/ha	% Yield impact due to Crown Rot
1	Barley	Skiff	-	95	255	2.19	
2	Barley	Skiff	2g	116	228	2.18	-0.5
3	Barley	Grout	-	97	219	3.22	
4	Barley	Grout	2g	92	213	3.40	5.5
5	Barley	Fitzroy	-	86	256	2.52	
6	Barley	Fitzroy	2g	88	236	2.53	0.3
7	Barley	Gairdner	-	107	250	2.72	
8	Barley	Gairdner	2g	94	234	2.60	-4.6
9	Wheat	EGA Wylie	-	101	138	2.40	
10	Wheat	EGA Wylie	2g	89	158	2.29	-4.6
11	Wheat	Sunco	-	85	158	2.59	
12	Wheat	Sunco	2g	85	160	2.21	-14.6
13	Wheat	Lang	-	92	136	2.18	
14	Wheat	Lang	0.5g	108	153	2.46	12.7
15	Wheat	Lang	1g	100	146	2.72	24.5
16	Wheat	Lang	2g	105	151	2.29	4.8
17	Wheat	Sunvale	-	106	176	2.64	
18	Wheat	Sunvale	2g	107	187	2.54	-3.8
19	Wheat	EGA Gregory	-	93	136	2.88	
20	Wheat	EGA Gregory	2g	102	152	2.94	2.2
21	Wheat	Strzelecki	-	90	105	2.79	
22	Wheat	Strzelecki	2g	88	137	2.67	-4.4
23	Wheat	Ellison	-	109	142	2.52	
24	Wheat	Ellison	2g	94	120	2.55	1.0
25	Durum	Bellaroi	-	104	109	2.33	
26	Durum	Bellaroi	2g	105	113	2.20	-5.5
27	Durum	Jandaroi	-	89	106	2.60	
28	Durum	Jandaroi	2g	77	119	2.27	-13.0
			P =	0.04	0.00	0.00	
			LSD 5% =	20	39	0.39	

DAP = Days after Planting

Yield cv= 10.9%

Significantly increased emergence

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Trt No	Crop	Variety	Crown Rot Inoculum Added	Screenings %	Test Weight kg/hL	Protein %	Grain Weight g/ 1000 Grains	Retention %	Moisture %
1	Barley	Skiff	-	33.2	65.2	18.7	32.2	10.8	
2	Barley	Skiff	2g	31.9	62.3	18.2	32.5	15.0	
3	Barley	Grout	-	5.6	69.0	14.6	41.7	69.2	
4	Barley	Grout	2g	4.7	69.7	14.3	42.0	71.9	
5	Barley	Fitzroy	-	20.8	63.2	15.5	34.3	36.0	
6	Barley	Fitzroy	2g	19.5	62.6	15.4	36.3	40.7	
7	Barley	Gairdner	-	31.6	63.9	16.9	34.7	12.4	
8	Barley	Gairdner	2g	28.6	64.2	17.0	35.0	15.9	
			P =	0.00	0.00	0.00	0.00	0.01	
			LSD 5% =	6.5	8.0	1.0	1.8	4.1	
9	Wheat	EGA Wylie	-	8.8	80.0	13.6	32.4		9.8
10	Wheat	EGA Wylie	2g	8.7	80.8	13.8	32.5		9.7
11	Wheat	Sunco	-	4.7	79.4	13.5	31.6		9.6
12	Wheat	Sunco	2g	6.1	79.7	13.1	31.2		9.8
13	Wheat	Lang	-	8.1	79.5	13.2	30.5		9.8
14	Wheat	Lang	0.5g	7.7	79.4	13.4	29.7		9.8
15	Wheat	Lang	1g	6.8	79.3	13.1	31.2		9.8
16	Wheat	Lang	2g	8.7	79.3	13.2	29.2		9.7
17	Wheat	Sunvale	-	5.1	79.9	13.7	31.0		9.8
18	Wheat	Sunvale	2g	6.8	79.6	13.9	29.8		9.8
19	Wheat	EGA Gregory	-	5.9	79.4	12.7	34.1		9.7
20	Wheat	EGA Gregory	2g	5.9	80.3	12.7	35.6		9.7
21	Wheat	Strzelecki	-	6.9	77.1	13.5	34.1		9.6
22	Wheat	Strzelecki	2g	7.5	77.1	13.7	33.6		9.5
23	Wheat	Ellison	-	5.1	81.6	14.3	38.2		10.0
24	Wheat	Ellison	2g	6.2	80.5	14.3	38.0		9.8
25	Durum	Bellaroi	-	4.2	78.9	16.1	39.0		9.8
26	Durum	Bellaroi	2g	7.1	78.5	16.1	36.8		9.7
27	Durum	Jandaroi	-	2.1	79.4	15.6	45.2		10.0
28	Durum	Jandaroi	2g	2.9	79.2	15.6	45.5		10.1
			P =	0.00	0.00	0.00	0.00		0.00
			LSD (5%) =	1.5	1.0	0.6	1.6		0.1

	Significantly reduced quality
	Significantly increased quality

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Table 3: Disease Ratings

Trt No	Crop	Variety	Crown Rot Inoculum Added	Crown Rot Severity	Disease Incidence % Fp Recovery
1	Barley	Skiff	-	12	9
2	Barley	Skiff	2g	23	40
3	Barley	Grout	-	8	11
4	Barley	Grout	2g	21	40
5	Barley	Fitzroy	-	7	6
6	Barley	Fitzroy	2g	20	44
7	Barley	Gairdner	-	13	19
8	Barley	Gairdner	2g	24	47
9	Wheat	EGA Wylie	-	3	9
10	Wheat	EGA Wylie	2g	16	41
11	Wheat	Sunco	-	1	4
12	Wheat	Sunco	2g	11	43
13	Wheat	Lang	-	1	5
14	Wheat	Lang	0.5g	3	13
15	Wheat	Lang	1g	6	29
16	Wheat	Lang	2g	13	42
17	Wheat	Sunvale	-	1	15
18	Wheat	Sunvale	2g	5	38
19	Wheat	EGA Gregory	-	2	6
20	Wheat	EGA Gregory	2g	11	42
21	Wheat	Strzelecki	-	2	7
22	Wheat	Strzelecki	2g	13	42
23	Wheat	Ellison	-	2	12
24	Wheat	Ellison	2g	12	47
25	Durum	Bellaroi	-	17	29
26	Durum	Bellaroi	2g	44	87
27	Durum	Jandaroi	-	12	15
28	Durum	Jandaroi	2g	42	67
			P =	0.00	0.00
			LSD 5% =	Arcsin detransf	9.5

Significantly increased disease

Crown rot severity = visual rating of extent and severity of stem browning

% Fp recovery = % of crowns where the crown rot fungus (*Fusarium pseudograminearum*) was recovered